Climate Change Data and Detection Program
NOAA/DOE Climate Change Detection and Attribution Project
Information Sheet FY 201

Background

Proposals are solicited on all aspects of climate change detection and attribution.
Detection is the process of demonstrating that an observed change in climate is unusual,
i.e., that the observed change is large relative to estimates of natural climate variability.
We broaden this standard definition to include those proposals that not only document
changes in climate, but also focus on producing a data set of adequate quality to permit
quantitative identification of interannual, decadal, and longer-term variations and
changes.

Detection proposals are encouraged on documenting and assessing variations and
changes, especially of weather and climate extremes. Successful proposals will address
data set errors in the context of defining significant changes.

Attribution is the process of establishing cause and effect in a scientifically rigorous way.
Attribution proposals will be considered that address part or all of the issues associated
with identifying natural climate variability, and making the linkage between specific
forcings and observed climate variations and changes, especially as related to extreme
events. Critical components of these proposals often will include the use of climate model
simulations, statistical techniques, and long-term climate data, including paleoclimate
data, to distinguish between natural and anthropogenic forcings of variability and change.

Detection and attribution activities do not necessarily have to be part of the same
proposal, e.g., attribution studies often rely on databases and modeling simulations that
have already been produced. Proposals will be entertained that either focus solely on
detection or attribution or combine both of these activities.

FY 2010 Priorities

In FY 2010, proposals will be viewed most favorably if they include one or more of the
following foci: (1) investigations of possible changes in the characteristics of
weather/climate extremes (tropical and extratropical storms, heavy precipitation events,
droughts, heat waves, wildfires, severe freezes, cold spells, etc); (2) detection and/or
attribution studies at continental and sub-continental scales, as appropriate to the
variable(s) being considered, the quality of the historical record, and the spatial/temporal
resolvability; and (3) multiple-model and ensemble approaches to further validate
detection results.

An emerging research area, single-event attribution, recognizes that an individual
weather/climate event cannot be identified as anthropogenically-forced but that the
probability, or the risk, of such an event occurring may be altered by the presence of a
human-induced component of forcing. Therefore, these types of investigations can
elucidate risk trends. Statistical (e.g., detection of trends in extreme statistics) and

modeling approaches can be used to identify changes in probabilities and the impact of anthropogenic forcing, with implications for risk management and decision making.

As noted, there will be a special emphasis on producing data sets that address weather and climate extremes and the detection and/or attribution of these extremes and their changing character, both historical and projected. Investigators are encouraged to utilize results from Phase 5 of the Coupled Model Intercomparison Project (CMIP5), to elucidate the character of weather and climate features under natural and anthropogenically-forced conditions. Studies that analyze extremes should address the limitations of the observational record (e.g., spatial/temporal resolution; continuity; homogeneity; biases; uncertainty estimates) and/or the limitations of the modeling approaches (e.g., high resolution global models; regional models; various downscaling techniques). Observations should be used to constrain and validate model results. Model studies should consider addressing the mechanisms that may change extremes in the future as part of any attribution work.

Extremes defined solely by statistical properties may not have large impacts on human or natural systems. Conversely, an event may not be an extreme in a strictly statistical sense, but still have a large impact. Extremes to be considered here are those that have substantial impact on human or natural systems (e.g., energy, agriculture, forestry, water, health, transportation, man-made infrastructure).

Although extremes often are single, episodic events, there also may be cumulative events that cause major, or even irreversible, impacts once a "threshold" is exceeded, e.g., levels of temperature or precipitation beyond which an impact becomes large. The changing frequency, intensity, duration, or timing of a stressor can be such a trigger for a human or natural system.

Additional Information

Proposals will be considered for up to three years in duration, but one and two-year proposals are encouraged. Funds for each subsequent year of multi-year proposals will be subject to a review of annual progress reports.

Proposals that involve modeling are encouraged to use model output from other studies or demonstrate that proposed model runs will receive substantial support from other sources.

Proposers should ensure that any data sets produced that document climate change have a dedicated archive identified for the data and indicate in the proposal the final disposition of the data.

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